

RECEIVED
CENTRAL FAX CENTER
OCT 18 2006

Appl. No. 10/788,433
Amdt. dated October 18, 2006
Reply to Office Action of May 18, 2006

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently amended) An electronic device comprising:
a first circuit portion; and
a linear regulator circuit connected to said first circuit portion, said linear regulator circuit comprising:
a circuit control node;
a circuit output node to which a load [[can be]] is connected, a voltage at said circuit output node being determined based on a voltage signal at said circuit control node;
an amplifier circuit having a first amplifier input and a second amplifier input, and further having an amplifier output, said first amplifier input configured for receiving a reference voltage, said amplifier circuit receiving power from a first voltage source;
a source follower circuit having a source follower input node and a source follower output, said amplifier output configured drive said source follower input node, said source follower output coupled to said circuit control node; and
a feedback circuit coupled between said circuit output node and said second amplifier input;
wherein a bandwidth at said circuit control node changes to track a bandwidth at said circuit output node as said load changes.
2. (Original) The electronic device of claim 1 wherein said electronic device is a hard disk device.

Appl. No. 10/788,433
Amdt. dated October 18, 2006
Reply to Office Action of May 18, 2006

PATENT

3. (Original) The electronic device of claim 2 wherein said first circuit portion is a hard disk device controller.
4. (Original) The electronic device of claim 1 further comprising a current mirror circuit coupled between said amplifier output and said source follower.
5. (Original) The electronic device of claim 4 further comprising a resistor component coupled between a second voltage source and said source follower input node.
6. (Original) The electronic device of claim 5 wherein said first voltage source is different from the second voltage source.
7. (Original) The electronic device of claim 1 wherein said source follower circuit comprises a transistor element in series connection with a current source.
8. (Original) The electronic device of claim 1 wherein said amplifier circuit comprises a single op amp component.
9. (Original) The electronic device of claim 1 wherein said feedback path comprises a pair of resistor components configured as a voltage divider.
10. (Currently amended) The electronic device of claim 1 wherein a pass element having a control node [[an can be]] is connected to said circuit control node, wherein a output node of said pass element [[can be]] is connected to said circuit output node, whereby said pass element can provide a regulated output voltage at its output node to [[a]] said load connected thereto.
11. (Currently amended) The electronic device of claim 10 wherein a second voltage source different from said first voltage source [[can be]] is connected to said load via said pass element, thereby providing a voltage to said load that is independent of said first voltage source.
12. (Currently amended) A hard disk controller circuit comprising:

Appl. No. 10/788,433
Amdt. dated October 18, 2006
Reply to Office Action of May 18, 2006

PATENT

a first circuit node;
a second circuit node to which a load is connected, wherein a voltage level therea
varies in accordance with a voltage level of said first circuit node;
an error amplifier having a first amplifier input configured to be coupled to a
reference voltage, having a second amplifier input, and having an amplifier output, said error
amplifier configured to receive power from a first voltage source;
a gain stage comprising a source follower circuit in electrical communication with
said amplifier output and with said first circuit node; and
a feedback path coupled between said second node and said second circuit
amplifier input, said feedback path including a pair of resistors configured as a voltage divider;
wherein a bandwidth at said first circuit node changes to track a bandwidth at said
second circuit node as said load changes.

13. (Currently amended) The circuit of claim 12 wherein a pass element
having a control node [[an can be]] is connected to said first circuit node, wherein a output node
of said pass element [[can be]] is connected to said second circuit node, whereby said pass
element can provide a regulated output voltage at its output node to [[a]] said load connected
thereto.

14. (Currently amended) The circuit of claim 13 wherein a second voltage
source different from said first voltage source [[can be]] is connected to said load via said pass
element, thereby providing a voltage to said load that is independent of said first voltage source.

15. (Original) The circuit of claim 12 wherein said gain stage comprises a
first transistor component in series with a current source and having a control terminal, said
amplifier output configured to drive said control terminal.

16. (Original) The circuit of claim 15 further comprising a resistor component
coupled between a second voltage source and said control terminal.

Appl. No. 10/788,433
Amdt. dated October 18, 2006
Reply to Office Action of May 18, 2006

PATENT

17. (Original) The circuit of claim 16 wherein said first voltage source and said second voltage source are the same.

18. (Original) The circuit of claim 16 wherein said first voltage source and said second voltage source are different.

19. (Currently amended) In a hard disk drive device, a method for regulating an output voltage level suitable for supplying power to a first circuit comprising:

detecting said output voltage level;

producing an error signal based on a comparison of said output voltage level relative to a reference voltage;

controlling a source follower circuit with said error signal to produce a source follower output at a source follower node; and

varying said output voltage level based on said source follower output at an output node to which a load is connected,

wherein a bandwidth at said output node has a pole at a frequency greater than [[the]] a unity gain frequency of said first circuit, and wherein a bandwidth at said source follower node changes to track said bandwidth at said output node as said load changes.

20. (Original) The method of claim 19 wherein said first circuit is a hard disk controller.

21. (Original) The method of claim 19 further comprising setting a DC operating point of said source follower circuit via a resistor element coupled to a first voltage source.

22. (Original) The method of claim 21 further comprising controlling a pass circuit with said source follower output to produce said output voltage level.

23. (Original) The method of claim 22 wherein controlling said pass circuit with includes applying said source follower output to a control node of said pass circuit, said

Appl. No. 10/788,433
Amdt. dated October 18, 2006
Reply to Office Action of May 18, 2006

PATENT

pass circuit being powered by a second voltage source, wherein a pole at said control node of said pass circuit varies with a pole at said circuit output node.

24. (Original) The method of claim 23 wherein said first voltage level is different from said second voltage level.

25. (Currently amended) A hard disk drive device having a hard disk controller, said hard disk controller including a voltage regulator circuit for regulating an output voltage level comprising:

first means for detecting said output voltage level;

second means for producing an error signal based on a comparison of said output voltage level relative to a reference voltage, said second means couple to a first voltage source; and

a source follower circuit in electrical communication with said first means to produce a source follower output at a source follower node,

wherein said output voltage level is varied in response to variances in said source follower output at an output node to which a load is connected,

wherein a bandwidth at said output node has a pole at a frequency greater than [[the]] a unity gain frequency of said voltage regulator circuit, and wherein a bandwidth at said source follower node changes to track said bandwidth at said output node as said load changes.

26. (Currently amended) The circuit of claim 25 wherein said source follower output [[can be]] is connected to a pass element that is connected to a second voltage source, wherein an output of said pass element constitutes said output voltage level.

27. (Original) The circuit of claim 25 further comprising a resistor component connected between said first voltage source and said source follower circuit.

28. (New) The electronic device of claim 1 comprising a total bandwidth that is a factor of 10 higher than a unity gain bandwidth of said electronic device.

Appl. No. 10/788,433
Amdt. dated October 18, 2006
Reply to Office Action of May 18, 2006

PATENT

29. (New) The circuit of claim 12 comprising a total bandwidth that is a factor of 10 higher than a unity gain bandwidth of said circuit.

30. (New) The method of claim 19 wherein the disk first circuit comprises a total bandwidth that is a factor of 10 higher than said unity gain bandwidth.

31. (New) The method of claim 25 wherein the voltage regulator circuit comprises a total bandwidth that is a factor of 10 higher than said unity gain bandwidth.